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Elizabeth T. Maynard
Purdue University - Main Campus, emaynard@purdue.edu

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Indiana growers harvested sweet corn for fresh market sales from 6,100 acres in 2009, with an average yield of 69 cwt/acre (164 crates or 3.45 tons per acre) and total value of $16.8 million (USDA NASS,2010). Indiana ranks 14th among states for production of fresh market sweet corn. The 2007 USDA Ag Census reported 603 Indiana farms producing sweet corn for fresh markets and 51 farms selling to processors. Sweet corn fields for fresh market sales are located throughout the state. In northern Indiana, bi-color corn is most commonly grown. Varieties with improved eating quality are of interest to both producers and consumers. Producers are also interested in yield, ear size, appearance, and agronomic characteristics. This paper reports on 28 bi-color and one yellow shrunken-2 (supersweet) sweet corn cultivars and experimental lines that were evaluated at the Pinney-Purdue Agricultural Center in Wanatah, Indiana.

Materials and Methods

The trial was conducted on a Tracy sandy loam. The fall 2009 soil test showed 1.5% organic matter, pH 6.7, and 34 ppm phosphorus (P), 103 ppm potassium (K), 190 ppm magnesium (Mg), 650 ppm calcium (Ca). Fertilizer (130 lb./acre 0-0-60 and 108 lb./acre 0-45-0) was broadcast to provide 48 lb. P_2O_5 and 78 lb. K_2O per acre. The trial was set up as a randomized complete block design with three replications. Cultivars were assigned to individual plots one row (30 inches) wide by 30 feet long. Corn was seeded May 28, 2010, with a finger pick-up planter and later thinned to 35 plants per 30-foot row (20,328 plants per acre). Nitrogen (N) (at 20.3 lb./acre) and P (at 18.2 lb./acre P_2O_5) were applied at planting from 19-17-0 (10 gal. /acre), and an additional 70 lb./acre N from urea ammonium nitrate solution was injected June 17. Tefluthrin (Force 3G®) was applied at planting to control corn rootworms. Weeds were controlled with atrazine (Atrazine 4L®) and s-metolachlor (Dual II Magnum®) applied and incorporated before seeding, one cultivation, and hand weeding. Irrigation was applied during the growing season as needed. Mancozeb (Dithane DF® 1.5 lb./acre) was applied on July 9 to control rust. Permethrin (Arctic 3.2EC®, 4 fl. oz./acre) was applied on July 30 to control caterpillars. Emergence was recorded six and 12 days after planting (DAP), before thinning. Sixty-one DAP, just before harvest, plant vigor, height, and degree of tiller formation were rated and the height from the soil to the middle of the ear was measured for three ears per plot. Each plot was harvested when corn reached marketable stage. The weights and numbers of marketable ears were recorded. Three ears from each plot were selected to evaluate degree of husk cover, husk tightness, degree of tip fill, overall attractiveness, average ear diameter and length after husking, and shank length. One person rated the flavor of each entry and noted whether the kernel pericarp seemed tough. Rating scales are described below and in table footnotes. Quantitative data with equal variance across treatments were analyzed using ANOVA followed by mean separation using Fisher's protected least significant difference at $P \leq 0.05$. Relationships between yield components, ear and plant characteristics, and average days to harvest were analyzed using linear regression.

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Characteristic	Rating Scale
Husk Cover	5=more than 2 inches cover. 4=1.25-2 inches. 3=0.75-1.25 inches. 2=less than 0.75 inch. 1=ear exposed.
Husk Tightness	3=tight. 2=firm. 1=loose.
Tip Fill	5=kernels filled to tip of cob. 4=less than 0.5 inch unfilled. 3=0.5-1 inch unfilled. 2=more than 1 inch unfilled. 1=more than 2 inches unfilled.

Results and Discussion

The growing season was wetter and warmer than normal. The USDA National Agricultural Statistics Service Indiana Crop & Weather Reports documented that from May 24 to August 15, the growing degree days (GDD) accumulation was 2,321, 387 more than normal. Rainfall during that period total 13.96 inches, 3.06 inches more than normal. More than half of the rain came in June, and rainfall from July 26 through August was 0.78 inch below normal.

Warm soil temperatures just after planting led to rapid emergence, and by 12 DAP emergence averaged 89% of the intended seeding rate (data not shown). After thinning all plots were within 98% of the desired stand of 20,328 plants per acre. Plant vigor ratings near harvest showed little difference among varieties (data not shown). Most varieties produced a few tillers (data not shown). Attraction was noted to have very few tillers.

Results for yield and ear quality are presented in Table 1. Per acre yields have been calculated by multiplying plot yields by the number of plots per acre and likely overestimate expected yield from field scale production. Marketable yield averaged 7.7 tons per acre. XTH 2281 and Sweet Surprise produced the highest yield, 9.0 tons per acre, but not significantly higher than seven other varieties. Pick Me produced the lowest yield of 5.4 tons per acre. The number of marketable ears ranged from 1,436 to 1,694 dozen per acre, and averaged 1,603. Varieties in the top 10 percent for dozens per acre included Sweet Surprise, EX 08767143, EX 08745857R, and Fusion. Varieties in the bottom 10 percent for dozens per acre included GSB 2873, HMX 8343BS, ACR 5140, and CAABF7-295. Average weight per ear ranged from 0.57 lb. (Pick Me) to 0.92 lb. (XTH 2281). Six varieties had an average ear weight greater than 0.86 lb. and did not differ significantly from XTH 2281: Stellar, XTH 2372, Sweet Surprise, O6G 2300, XTH 2170, and ACR 7914.

Ear length ranged from 7.0 to 8.4 inches, and diameter ranged from 1.64 to 1.98 inches. The longest ears were produced by O6G 2300, ACR 7914, ACR 5140, and EX 08767143 (8.1 to 8.4 inches). The shortest ears ranged from 7.0 to 7.3 inches and included Attraction, Awesome, Pick Me, Sweet Surprise, and Mirai 311BC. Ear length was positively correlated with days to harvest: later maturing varieties tended to have longer ears. O6G 2300 had longer ears and Attraction had shorter ears than would be expected based on their harvest dates. Varieties that had ears with a diameter of 1.9 inches or greater included XTH 2673, EX 08745857R , Fantastic, ACR 5158, XTH 2281, XTH 2773, Sweet Surprise, ACR 5140, EX 08767143, Fusion, XTH 2372, XTH 2573, O6G 2300, Obsession, and Attraction. Varieties with ear diameter 1.8 inches or less included Pick Me, Legion, and ACR 7904. Shank length ranged from 3.5 inches to 6.9 inches and averaged 5.0 inches. Varieties with the longest shanks included HMX 8343BS, Stellar, Sweet Surprise, XTH 2281, and O6G 2300 (5.8 to 6.9 inches). Pick Me had the shortest shanks at 3.5 inches, but 11 other varieties were not significantly different. Ear height, measured from

the ground to mid-ear, ranged from 22.3 inches for Pick Me, to 36.5 inches for ACR 7199. ACR 7199 had significantly higher ears than any other variety.

Husk cover ratings averaged 3.4. Nine varieties averaged 3.9 or better, indicating at least 1.25 inches of husk cover: Sweet Surprise, ACR 7904, ACR 7905, GSB 2873, XTH 2281, Awesome, CAABF7-295, Bueno, O6G 2300, and XTH 2170. Legion, XTH 2673, Obsession, ACR 5140, Fantastic, Attraction, ACR 7199, XTH 2372, Stellar (XTH 2576), Pick Me, EX 08745857R, XTH 2773, Mirai 311BC, and Fusion averaged between 2.7 and 3.8, indicating 0.75 to 1.25 inches of cover on most ears. ACR 5158 averaged 1.7, indicating some ears had kernels showing. The husks of ACR 5158, XTH 2573, O6G 2300, XTH 2673, Attraction, and Mirai 311BC were loose around the ear tip. Tip fill ratings averaged 4.8 out 5, and no variety received a rating less than 4.1, indicating less than 0.5 inch of the tip unfilled. Varieties with a rating of 5 for tip fill included Mirai 311BC, ACR 7914, ACR 7904, XTH 2170, XTH 2372, Sweet Surprise, Stellar (XTH 2576), Bueno, Obsession, EX 08767143, and CAABF7-295. For overall ear quality in terms of appearance, ACR 7905, ACR 7904, XTH 2372, XTH 2773, and XTH 2281 received the highest ratings, between 7.7 and 8.0. Other varieties above the 6.2 average included Legion, ACR 7199, ACR 7914, XTH 2170, Obsession, O6G 2300, Fusion, EX 08767143, CAABF7-295, GSB 2873, Awesome, Sweet Surprise, and Bueno. ACR 5158 received the lowest rating of 2.7, in large part due to the poor husk cover.

Varieties that received flavor ratings of very good to excellent, or better, included Awesome, XTH 2170, XTH 2673, XTH 2372, ACR 7904, XTH 2573, ACR 7905, and ACR 5140. Absence of pericarp toughness was noted for at least two of three ears tasted for ACR 7904, Awesome, HMX 8343BS, Stellar, XTH 2372, and XTH 2573 (data not shown). Varieties noted as having a tough pericarp in at least two of three ears tasted were ACR 7914, Bueno, Fusion, Pick Me, and XTH 2281.

Often, producers select one or two varieties in each maturity range so it is helpful to compare varieties of similar maturity. Among the ten varieties harvested 68 to 70 days after planting, Sweet Surprise and Stellar produced the greatest tons per acre, but not significantly more than XTH 2170. Sweet Surprise also produced greatest number of ears per acre, followed by Stellar and XTH 2773. XTH 2170, XTH 2773, and Fantastic had the longest ears, and Pick Me and Awesome had the shortest ears among these ten early varieties. XTH 2773 was considered the most attractive overall but Awesome, Sweet Surprise, XTH 2170, ACR 7199, GSB 2873, and Stellar were also rated above the average of 6.2 for this trial. Of the six varieties harvested 71 to 73 days after planting, XTH 2372 produced the most tons per acre, but not significantly more than Bueno or HMX 8343BS. Bueno and ACR 7904 produced the greatest number of ears per acre. The longest ears in this maturity group were produced by HMX 8343BS, XTH 2372, and ACR 7904. Varieties with overall ratings above average for the trial included XTH 2372, ACR 7904, and Bueno. The remaining 12 bi-color varieties were harvested about 74 to about 76 days after planting. The highest yielding in tons per acre were XTH 2281, EX 08767143, Obsession, Fusion, and EX 08745857R. These five, plus XTH 2573, also produced the greatest number of ears per acre in this maturity group. Varieties with ears 8 inches or longer were ACR 7914, ACR 5140, and EX 08767143. Attraction and CAABF7-295 had the shortest ears in this group, followed by Legion. 08767143. Husk cover was only fair for several varieties in this group: XTH 2573, ACR 5140, EX 08767143, Legion, and ACR 7914. XTH 2281 received the best overall rating for ear appearance, but ACR 7905 was not far behind.

Careful evaluation of results presented in Table 1 combined with results from other locations and years should aid producers in selecting varieties best suited to their operations.

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Table 1. Yield, ear size, and quality of 28 bi-color and one yellow supersweet sweet corn in northern Indiana, 2010. Varieties listed in order of harvest date.

Cultivar	Seed Source[1]	Days to Harvest[2]		GDD to Harvest[3]	Yield of Marketable Ears		Avg. Ear Weight *lb*	Ear Length *in*	Ear Dia. *in*	Shank Length *in*	Ear Ht. *in*	Husk Cover[4]	Husk Tight-ness[4]	Tip Fill[4]	Overall[4]	Flavor[5]
		Pred.	Actual		*doz/A*	*ton/A*										
Pick Me	CR	70	68.0	1,509	1,581±43	5.4	0.57	7.1	1.64±0.03	3.5	22.3	3.3±0.3	1.2±0.1	4.1±0.1	6.0±0.6	G-VG
Awesome	ST	74	69.0	1,534	1,629±16	8.1	0.83	7.1	1.86±0.01	5.2	26.2	4.3±0.0	1.7±0.2	4.9±0.1	7.0±0.0	E-VG
Sweet Surprise	RI	75	69.0	1,534	1,694±0	9.0	0.88	7.3	1.93±0.03	6.7	26.9	3.9±0.3	1.8±0.5	5.0±0.0	7.0±0.0	VG
XTH 2170	RU	72	69.0	1,534	1,597±28	8.3	0.86	7.8	1.86±0.04	5.4	23.3	5.0±0.0	1.7±0.2	5.0±0.0	6.3±0.3	VG-E
XTH 2773	RU	–	69.3	1,541	1,662±32	7.7	0.78	7.7	1.92±0.04	3.8	24.8	3.6±0.2	1.6±0.1	4.9±0.1	8.0±0.0	VG
Fantastic	ST	73	69.7	1,549	1,646±48	7.9	0.80	7.7	1.92±0.04	5.7	24.7	3.0±0.4	1.4±0.3	4.9±0.1	5.3±0.7	VG-M
ACR 7199	AC	78	70.0	1,556	1,597±28	7.0	0.73	7.4	1.83±0.00	4.5	36.6	3.1±0.2	1.4±0.1	4.9±0.1	6.3±0.9	E-G
GSB 2873	ST	75	70.0	1,556	1,517±70	6.8	0.75	7.6	1.88±0.05	3.9	26.2	4.1±0.2	2.1±0.6	4.2±0.2	7.0±0.6	VG
Stellar	IF	77	70.0	1,556	1,662±32	8.9	0.90	7.6	1.89±0.01	6.8	27.1	3.3±0.4	2.0±0.3	5.0±0.0	7.3±0.3	VG-G
XTH 2673	RU	73	70.0	1,556	1,646±28	7.3	0.74	7.5	1.90±0.04	4.4	22.6	2.7±0.2	1.1±0.1	4.9±0.1	4.7±0.7	VG-E
HMX 8343BS	HM	75	71.0	1,579	1,517±85	7.6	0.84	7.9	1.82±0.03	6.9	29.9	2.4±0.5	1.4±0.3	4.9±0.1	4.7±0.9	VG
Mirai 311BC	CE	76	71.0	1,579	1,597±56	6.5	0.68	7.3	1.83±0.02	5.1	27.4	3.7±0.2	1.1±0.1	5.0±0.0	5.7±0.3	VG-G
XTH 2372	RU	74	72.0	1,601	1,549±97	8.3	0.89	7.8	1.93±0.01	5.3	27.2	3.1±0.3	1.8±0.4	5.0±0.0	7.7±0.3	E-VG
ACR 5158	AC	77	73.0	1,624	1,533±90	7.3	0.80	7.6	1.92±0.02	4.9	31.7	1.7±0.3	1.0±0.0	4.1±0.2	2.7±0.3	VG
ACR 7904	AC	74	73.0	1,624	1,613±32	7.3	0.76	7.8	1.79±0.04	5.5	29.2	4.0±0.5	1.7±0.3	5.0±0.0	7.7±0.3	VG-E
Bueno	CR	80	73.0	1,624	1,662±16	7.7	0.77	7.4	1.83±0.02	5.1	29.9	4.7±0.2	2.0±0.2	5.0±0.0	7.0±0.6	G-VG
ACR 5140	AC	74	73.7	1,643	1,517±58	7.3	0.81	7.7	1.86±0.01	4.3	23.1	3.0±0.2	1.9±0.1	4.9±0.1	5.3±0.3	VG
EX08745857R	RU	76	73.7	1,643	1,678±16	8.1	0.80	7.7	1.92±0.04	5.4	25.1	3.4±0.1	1.3±0.2	4.4±0.1	4.3±0.3	E-G
O6G2300 (yel.)	RU	78	73.7	1,643	1,629±16	8.5	0.87	8.4	1.94±0.01	5.8	28.8	4.7±0.2	1.0±0.0	4.1±0.5	6.7±0.3	VG
XTH 2573	RU	73	73.7	1,643	1,646±28	7.9	0.80	7.7	1.93±0.01	4.6	25.4	2.6±0.1	1.0±0.0	4.8±0.2	5.0±1.2	VG-E
ACR 7905	AC	74	74.3	1,661	1,549±28	7.5	0.81	7.7	1.88±0.05	5.1	29.4	4.1±0.1	1.3±0.2	4.7±0.2	7.7±0.3	VG-E
Attraction	RU	76	74.3	1,661	1,629±16	7.4	0.76	7.0	1.98±0.03	4.8	23.3	3.0±0.4	1.1±0.1	4.6±0.2	5.3±0.7	VG
CAABF7-295	CR	81	74.3	1,661	1,468±81	6.6	0.75	7.4	1.86±0.03	3.7	32.7	4.4±0.3	2.6±0.3	5.0±0.0	6.7±0.3	VG
Fusion	RU	75	74.3	1,661	1,678±16	8.3	0.83	7.7	1.93±0.01	4.2	25.6	3.7±0.2	1.2±0.1	4.7±0.2	6.7±0.3	VG-G
Obsession	RU	80	74.3	1,661	1,662±16	8.5	0.85	7.9	1.94±0.04	5.2	29.6	3.0±0.3	2.1±0.1	5.0±0.0	6.3±0.3	VG
XTH 2281	RU	81	74.3	1,661	1,646±0	9.0	0.92	7.7	1.92±0.06	6.4	31.4	4.1±0.2	2.6±0.2	4.9±0.1	8.0±0.0	G-VG
ACR 5140	AC	74	75.0	1,680	1,436±32	6.9	0.80	8.1	1.93±0.01	3.9	27.1	2.3±0.5	2.2±0.2	4.8±0.2	5.0±1.5	VG-E
EX 08767143	RU	80	75.0	1,680	1,694±0	8.5	0.83	8.1	1.93±0.01	4.4	29.9	2.3±0.2	2.2±0.4	5.0±0.0	6.7±0.3	VG
Legion	SY	78	75.0	1,680	1,629±43	6.8	0.70	7.5	1.76±0.01	5.2	32.6	2.7±0.2	1.8±0.1	4.6±0.3	6.3±0.3	G-M

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Table 1 (*continued*)

Cultivar	Seed Source[1]	Days to Harvest[2]		GDD to Harvest[3]	Yield of Marketable Ears		Avg. Ear Weight *lb*	Ear Length *in*	Ear Dia. *in*	Shank Length *in*	Ear Ht. *in*	Husk Cover[4]	Husk Tight-ness[4]	Tip Fill[4]	Overall[4]	Flavor[5]
ACR 7914	AC	80	76.3	1,716	1,533±81	8.0	0.86	8.3	1.89±0.06	4.3	27.1	2.6±0.1	1.3±0.2	5.0±0.0	6.3±0.3	G-VG
Grand Mean					*1,603*	*7.7*	*0.80*	*7.6*	*1.92*	*5.0*	*27.6*	*3.4*	*1.6*	*4.8*	*6.2*	–
LSD .05[6]					–	*0.9*	*0.06*	*0.4*	–	*1.2*	*3.3*	–	–	–	–	–
r^2 [7]					*ns*	*ns*	*ns*	*0.19*	*ns*	*ns*	*ns*	–	–	–	–	–

[1]Seed Source: AC=Abbott & Cobb, CE=Centest, CR=Crookham, HM=Harris Moran, IF=Illinois Foundation Seed, RI=Rispens, RU=Rupp, ST=Stokes, SY=Syngenta.

[2]Days from planting to harvest. Predicted number is from seed supplier. Actual values for this and other columns are means of three replications±standard error if AOV not performed.

[3]GDD=corn growing degree days.

[4]Husk cover, tip fill: 1=worst. 5=best. Husk tightness: 1=loose. 3=very tight. Overall: 1=worst. 9 =best. Mean ± standard error.

[5]Flavor: G=good. VG=very good. E=excellent. Summary of ratings by one person for three ears per cultivar.

[6]Means differing by more than this amount are significantly different at $P \leq .05$ based on Fisher's Protected LSD. – AOV not performed.

[7]r^2 for regression vs. actual days to harvest is the proportion of variability explained by days to harvest. ns=regression not significant at $P \leq .05$.